



Freshwater Fish Inventory Northeast National Parks, 1999-2001 Appendix

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Massachusetts Cooperative Fish and Wildlife Research Unit**Northeast National Park Freshwater Fish Inventory****Appendix****Fish Key: Defining Characteristics for Reference Specimens****Family Anguillidae****American Eel (*Anguilla rostrata*)**

Reference specimen used for identification was American Eel from CACO- Herring River- 000925

- Has jaws
- Single gill slits
- No pelvic fins
- Dorsal fin begins well behind pectoral fins

Family Catostomidae**White Sucker (*Catostomus commersoni*)**

Reference specimen used for identification was White Sucker from SARA- Kroma Kill- 001014

- > 55 and < than 80 scales in lateral line
- About 25 scale rows crossing the midline in front of the dorsal fin
- Short snout
- 2 chambered swim bladder
- Head convex
- No definite saddle-shaped crossbands
- Lateral line complete, but may be inconspicuous in juveniles
- < 18 dorsal rays

Family Centrarchidae**Bluegill (*Lepomis macrochirus*)**

Reference specimen used for identification was Bluegill from MORR- Indian Grave Brook- 001005

- Long, pointed pectoral fin extending past lateral line when placed parallel to the edge of gill cover
- Maxillary ends below or in advance of front of eye
- Prominent black spot on soft dorsal fin
- Opercular flap black to its margin
- Gill rakers long reaching the base of the 2nd or 3rd gill raker below; 20 gill rakers

Green Sunfish (*Lepomis cyanellus*)

Reference specimen used for identification was Green Sunfish from MIMA- Mill Brook- 0010125

- 3 anal spines
- Forked caudal fin
- Mouth large with maxillary ending below front of pupil
- Eye small, equal to or shorter than the length of the snout
- Gill rakers long (14), tips reaching to base of second below
- Opercular flap with a light margin
- Last ray of pelvic fin bound to body for 1/2 to 2/3 it's length
- Pectoral fin asymmetrically rounded with an oblique base

Largemouth Bass (*Micropterus salmoides*)

Reference specimen used for identification was Largemouth Bass from MIMA- Unnamed Pond (Main Visitor's Center)- 001025

- Deeply notched dorsal fin
- Mouth large reaching beyond posterior edge of eye (shorter in juveniles)
- Green coloration with a prominent longitudinal stripe along midside
- Caudal fin of juveniles sometimes has an orange or reddish wash, not banded as in smallmouth young
- 3 anal spines, spiny first dorsal
- Complete lateral line

Pumpkinseed (*Lepomis gibbosus*)

Reference specimen used for identification was Pumpkinseed from SARA- Davidson's Farm Pond- 001016

- Long, pointed pectoral fin extending past lateral line when placed parallel to the edge of gill cover
- Maxillary ends below or in advance of front of eye
- Opercular flap with a light margin
- No prominent spot in dorsal fin
- Gill rakers shorter not reaching the base of the second one below

Redbreast Sunfish (*Lepomis auritus*)

Reference specimen used for identification was Redbreast Sunfish from ROVA- Meriches Kill- 001011

- 3 anal spines
- Forked caudal fin
- Small mouth, maxillary ending below front of eye
- Eye larger, longer than snout
- 10-12 short gill rakers, not reaching second raker below
- Opercular flap black without a pale margin
- Opercular bone flexible and fimbriate at margin
- Pectoral fin short and rounded, not reaching above lateral line
- Last ray of pelvic fin bound to body for half its length

Rock Bass (*Ambloplites rupestris*)

Reference specimen used for identification was Rock Bass from ROVA- Crum Elbow Creek- 001010

- 5+ anal spines
- 11 or 12 dorsal spines
- Ctenoid scales (rough to touch)
- Posterior part of the ventral edge of the preopercle serrate
- Ventral and horizontal margins of preopercle meet at a 90° angle
- Rear edge of preorbital bones serrate

Family Cyprinidae**Creek Chub (*Semotilus atromaculatus*)**

Reference specimen used for identification was Creek Chub from MORR- Indian Grave Brook- 001005

- Black spot on first 3 dorsal rays
- Lateral line scales 52-62
- Subterminal barbel located in groove above maxillary; sometimes difficult to see and sometimes absent in small fish
- Dorsal fin short < 12 rays
- Lateral line is obsolescent in larger adults
- Scales below lateral line are outlined only at distal edge
- Juveniles with conspicuous midlateral stripe
- Tubercles found from upper lip over eye with smaller ones on operculum and it's membrane and on scales of anterior parts of body and on rays of pectoral, pelvic, anal, and caudal fins of breeding males only.
- 9 gill rakers

Fallfish (*Semotilus corporalis*)

Reference specimen used for identification was Fallfish from SAGA-Blow-me-down Pond- 001019

- No black spot on first three rays of dorsal
- Lateral line scales 43-50
- Dorsal short less than 12 rays
- 7 gill rakers
- Scales not crowded in front of dorsal
- Juveniles have distinct mid-lateral stripe
- Subterminal barbel just forward of corner of mouth

Cutlips Minnow (*Exoglossum maxillingua*)

Reference specimen used for identification was from ROVA- Crum Elbow Creek- 001010

- Large mouth with lower jaw divided into three lobes (outer two lobes are fleshy and inner one is bony)
- No barbels

- Heavy-bodied
- Weakly developed midlateral stripe and small basicaudal spot in some
- Mouth low, horizontal, and overhung by snout
- Frenum present
- Small pelvic axillary processes

Eastern Blacknose Dace (*Rhinichthys atratulus*)

Reference specimen used for identification was from SARA- Kroma Kill- 001014

- Terminal maxillary barbel
- Small scales with 55 or more in lateral line
- Upper jaw non-protractile with upper lip joined to tip of snout by a bridge of tissue (frenum)

Golden Shiner (*Notemigonus crysoleucas*)

Reference specimen used for identification was Golden Shiner from SARA- Old Champlain Canal- 001014

- Mouth without teeth on jaw bones
- Short dorsal fin < 12 rays
- Lateral line longer with at least 10+ pored scales
- Compressed body
- Moderately sharp keel-like area just in front of anus
- Lateral line deeply decurved
- Keel in front of anus short, fleshy and unscaled
- Moderately developed pelvic axillary process
- Lateral dark stripe in juveniles

Longnose Dace (*Rhinichthys cataractae*)

Reference specimen used for identification was from SARA- Kroma Kill- 001014

- Terminal maxillary barbel
- Small scales with 55 or more in lateral line
- Upper jaw non-protractile with upper lip joined to tip of snout by a bridge of tissue (frenum)
- Long snout projecting well beyond inferior mouth

Common Shiner (*Notropis cornutus*)

Reference specimen used for identification was from ROVA- Crum Elbow Creek-001010

- Anterior dorsolateral scale count of 17-25
- No prominent stripes on upper part of body, except in breeding males who sometimes have wide longitudinal stripes
- No pigment on chin and gular region
- Slab-sided body
- 7-9 anal rays
- Regular, diamond-shaped scales
- No definite pigment in interradiation membranes of dorsal fin
- scales not especially crowded in front of dorsal fin
- No conspicuous spot at front of dorsal fin base
- Mouth large and oblique or horizontal
- Lower jaw U-shaped

- No extra intestinal loops
- No predorsal spot
- < 55 scales in lateral series

Rosyface Shiner (*Notropis rubellus*)

Reference specimen used for identification was from SARA- Kroma Kill-001014

- Pectoral rays 13-14
- Margin of extended anal straight
- Chin weakly pigmented without a distinctive backward mark on gular midline
- No conspicuous paired spots between nostrils
- Pelvic rays 7 or 8
- Mid-dorsal stripe well-developed
- Snout more pointed, about equal to postorbital head length
- No dark pigment on anterior interradyal membranes of dorsal fin
- Scales regularly diamond-shaped
- Scales before dorsal not crowded
- No conspicuous spot at dorsal fin base
- Mouth fairly large and oblique or horizontal
- Lower jaw U-shaped
- Intestine short and S-shaped with no extra loops

Family Cyprinodontidae**Banded Killifish** (*Fundulus diaphanus*)

Reference specimen used for identification was Banded Killifish from ROVA- Meriches Kill-001011

- Origin of dorsal fin in front of anal fin
- Females with a fleshy, oviducal sheath around the anterior rays of the anal fin
- Pelvic fins abdominal originating well-behind base of pectoral fin
- Premaxillary protractile, mouth strongly oblique
- Jaw with teeth in single points and bands of teeth in more than one row
- Pelvic fin retrogressive with last rays connected to body for about 1/3 of length
- Top of head scaled, no preorbital scales as in striped killifish
- Scales conspicuously outlined with a row of melanophores

Mummichog (*Fundulus heteroclitus*)

Reference specimen used for identification was Mummichog from ROVA- Meriches Kill-001011

- Protractile mouth
- Deeper bodied depth at least 3X into SL
- More than one row of conical teeth
- Lateral line scales 31-35 (38)
- Dorsal fin of males originating over or slightly ahead of anal fin
- Blunt snout with length slightly longer than width of eye
- Lacks longitudinal lines as in striped killifish

- Males exhibit spot on posterior rays of dorsal fin
- Presence of mandibular pores unlike in rainwater killifish (Whitworth 1996)
- 11-12 dorsal rays
- lacks preorbital scales as in striped killifish
- distinguishable from rainwater killifish from dark spot anterior to dorsal fin, no mandibular pores (Whitworth 1996), one row of conical jaw teeth, 23-29 lateral line scales (Peterson Guide)

Family Esocidae

Chain Pickerel (*Esox niger*)

Reference specimen used for identification was from ROVA- Upper Pond- 001010

- Cheek and opercle fully scaled
- Branchiostegal rays 14-17 on each side
- Long snout
- Dark suborbital bar nearly vertical

Redfin Pickerel (*Esox americanus americanus*)

Reference specimen used for identification was Redfin Pickerel from ROVA- Upper Valkill Pond- 001009

- Cheeks and opercles fully scaled
- Branchiostegal rays 11-13
- Upper profile of snout convex
- Lower fins of adults red-orange in life
- Greater than 5-6 notched (heart-shaped scales) between pelvic fins and greater than 5-7 notched (heart-shaped) scales in a diagonal row from origin of anal fin to dorsal
- Dark suborbital bar curves backward

Family Ictaluridae

Brown Bullhead (*Ictalurus nebulosus*)

Reference specimen used for identification was Brown Bullhead from SARA – Davidson's Farm Pond- 001016

- Anal rays (19)21-24
- Caudal fin square or slightly emarginate
- Chin barbels gray or black
- Gill rakers 13-16
- Pectoral fin with strong posterior serrations
- Jaws equal length
- membranes of vertical fins dusky

Family Percidae

Johnny Darter (*Etheostoma nigrum*)

Reference specimen used for identification was Johnny Darter from SARA- Kroma Kill- 001014

- 1 anal spine

- Infraorbital canal usually interrupted with 4 pores in anterior section and 2 pores in posterior section
- 10-11(12) pectoral rays
- Mouth horizontal; profile before eyes steeply declivous so the profile is almost vertical
- Lateral lines unpored
- Teardrop beneath eye absent or barely there\

Tessellated Darter (*Etheostoma olmsted*)

Reference specimen used for identification was Tessellated darter from MORR- Passaic River- 001004

- 1 anal spine
- Complete infraorbital canal, usually with 8 pores (not easily seen)
- More pectoral fin rays than *e. Nigrum*
- Mouth somewhat oblique; snout pointed; profile sloping at the mouth
- Teardrop beneath eye prominent
- Hybridization between *e. Nigrum* and *e. Olmsted* and may cause difficulty in id as 2 distinct species
- Specimens from downstream areas of problematic populations tend to be more olmsted-like, upstream ones more nigrum-like.

Family Salmonidae

Brook Trout (*Salvelinus fontinalis*)

Reference specimen used for identification was Brook Trout from MORR- East Primrose Brook- 001003

- Coloration darker with spots, some spots red and worm-like markings
- Mouth large, reaching to below eye or beyond
- 7-12 anal rays (not counting the small splint-like rays at the front of the anal fin)
- Teeth along the mid-line of roof of mouth (vomerine teeth) confined to a raised area at front of vomer bone
- Caudal fin square or slightly forked
- Pelvic and anal fins with a dark stripe behind white leading edge

	Rainbow	Brown	Brook
Anal rays	8-12	10-12	9-13
Dorsal rays	10-12	12-14	10-14
Pectoral rays	11-17	13-14	11-14
Pelvic rays	9-10	9-10	8-10

Rainbow Trout (*Salmo gairdneri*)

Reference specimen used for identification was from MORR- Indian Grave Brook- 001002

- Coloration of dark markings on a light background; many spots on tail
- Conspicuous dark margin around adipose fin
- Fewer than 13 anal rays

Family Umbridae**Central Mudminnow (*Umbra limi*)**

Reference specimen used for identification was Central Mudminnow from SARA- Old Champlain Canal (Section 5)- 0010—

- Small mouth, snout shorter than postorbital head length
- Snout not broad and flat
- Tail rounded
- Small size not exceeding 5 inch TL
- Premaxillary nonprotractile (without groove between upper lip and tip of snout)
- Mouth with teeth on jaw bones
- Vertical bar at caudal base; no horizontal bars along sides

Family Cottidae**Slimy Sculpin (*Cottus cognatus*)**

Reference specimen used for identification was from MORR- West Primrose Brook- 001003

- Gill membranes broadly attached to isthmus
- Lateral line incomplete
- Upper preopercular spine curved but not hooked upward and forward; shorter with a length less than $\frac{2}{3}$ diameter of eye
- Pelvic rays typically i, 3
- Palatine teeth usually absent
- Anal fin interradial membranes deeply notched
- Caudal peduncle always shorter than postorbital head length
- 1 anal spine

Massachusetts Cooperative Fish and Wildlife Research Unit**Northeast National Park Freshwater Fish Inventory****Appendix****Sampling Notes****Weir Farm National Historic Site****Weir Farm Pond Area**

Habitat Description (see map): submergent and floating vegetation; soft, mucky bottom; surrounded by wooded area and some areas also with dense brush; outflow directly beside dam; inflow directly across pond; both were dry until a heavy rain on one night; small island just to one side of dam (densely vegetated with brush and trees).

Habitat Stratification: pond small enough to classify as one habitat type; however set nets around inflow area, island, dam, and vegetated areas.

Sampling Pros Vs. Cons: fyke nets difficult to set due to thickness of submerged vegetation and bottom type; seine not possible due to softness of bottom, vegetation, and debris.

Comments: thin section of wooded area between pond and private property; at least two or three houses with manicured lawns.

Massachusetts Cooperative Fish and Wildlife Research Unit**Northeast National Park Freshwater Fish Inventory****Appendix****Sampling Notes****Marsh Billings Rockefeller National Historical Park****The Pogue**

Habitat Description: (see maps) man-made impoundment, formerly a bog; an outflow pipe at dam; several places in pond where bottom is released and setting just below surface of water; floating vegetation sparse to dense; bottom type generally soft and mucky with a lot of raised roots and coarse woody debris; rocky substrate around dam; ringed by wooded area.

Habitat Stratification: could probably consider it to be all one-habitat type because of small size of pond; no one area of "different" habitat is large enough to make it a separate habitat type

Sampling Pros Vs. Cons: easy access; seining not easily done in area due to bottom type and woody debris; all other nets easily deployed.

Comments: road around entire pond for administrative use only.

Unnamed Stream

Habitat Description: higher gradient; fast flowing; low flow; rock, cobble, gravel substrate; riffle, run, pool sequences of flow; under forest canopy; sections with high amount of coarse woody debris; runs out of pond outflow pipe.

Habitat Stratification: one habitat type

Sampling Pros Vs. Cons:

Comments: not considered important; not sampled for this reason.

Massachusetts Cooperative Fish and Wildlife Research Unit**Northeast National Park Freshwater Fish Inventory****Appendix****Sampling Notes****Morristown National Historical Park****Indian Grave Brook**

Habitat Description: rock, cobble substrate; under forest canopy; higher gradient; fast flowing; water level good; riffles, runs, and pools; pools about a ½ meter in depth with softer bottoms; water clarity good; approximately 20 feet in width.

Habitat Stratification: only one habitat type with park boundaries (see above description). Other habitat type appears to be a slower moving, softer bottom, poorer water quality, more channelized; runs through grassy pasture; not quite as wide as above habitat.

Sampling Pros Vs. Cons: easy access; electrofishing seems to work well. Korker's necessary for walking in stream.

Comments: road runs nearby stream for length with in park boundaries; private home between two park owned sections of brook where habitat changes; stone structures, possibly remnants of a grist mills (one just upstream of private property and the other just below upper bridge); park boundaries marked where road crosses at each end.

Cat Swamp Pond

Habitat Description: small man-made pond; banks raised up; steep sided; soft bottomed; lot of coarse woody debris; water clarity poor.

Habitat Stratification: all one habitat

Sampling Pros Vs. Cons: difficult to set and pull fyke nets due to the amount of coarse woody debris; pond too small for a trammel net; access extremely easy.

Comments: trail runs right along one side of pond.

Primrose Brook**Habitat Description**

Main Branch: lower gradient; fast flowing; rock, cobble, gravel substrate; under forest canopy; approximately 20 feet wide; riffle, run, and pool sequence; pools about ½ meter deep with a more silty bottom; small amount of channelization

East Branch: moderate gradient; lower flowing, shallow, narrower (2 feet with pools no more than 10 feet); riffles and runs with some deeper, soft-bottomed pools; under forest canopy

West Branch: lower branch similar to main branch slightly narrower; under forest canopy, a little more channelized; upstream of Jockey Hollow road becomes very low gradient, much more channelized and bordered by a grassy wetland surrounded by wooded area; gravel, silt bottom.

Sampling Pros Vs. Cons

Main Branch: electrofishing works well

East Branch: electrofishing works well (a little narrow and shallow though)

West Branch: electrofishing works well

Comments

Main Branch: sampled from park boundary upstream 8 25 meter transects

East Branch: sampled 2 transects just upstream of confluence; two more transects were sampled adjacent to Cat Swamp Pond; fourth transect stopped just below a possible fish barrier (may or may not be seasonal, water levels were very low here)

West Branch: sampled four transects just upstream of confluence and four more just upstream of Jockey Hollow Road

Passaic River

Habitat Description: about 30-40 feet wide; moderate gradient; fast flowing; rock, cobble, and some boulders for substrate; under forest canopy; riffles, runs, and some pools; pools are deep (1/2 m to over a meter)

Habitat Stratification: could be considered one habitat type with the exception of the large pool in the center of the park owned section

Sampling Pros Vs. Cons: difficult access for the amount of equipment we needed to take in; river is at the bottom of a steep ravine

Comments: sampled majority of Passaic River within park boundaries

Jersey Brook

Habitat Description: low flow; higher gradient; narrow, shallow, rock, cobble substrate; under forest canopy with some coarse, woody debris and organic matter; several seasonal fish barriers

Habitat Stratification: could be considered one habitat type

Sampling Pros Vs. Cons: barely enough water to sample; access easy.

Comments: trail crosses over stream; only within park boundary for a very small distance

Massachusetts Cooperative Fish and Wildlife Research Unit**Northeast National Park Freshwater Fish Inventory****Appendix****Sampling Notes****Roosevelt Vanderbilt National Historic Sites****Upper Valkill Pond**

Habitat Description: mucky, soft-bottomed; shallow (only 6 inches 1 foot in most places); greatest depth was in the channel (a little over a meter); heavily vegetated with submergent and emergent vegetation. Submergent vegetation extends from bottom to surface of water; riparian area is mostly a purple loose strife wetland

Habitat Stratification: all one-habitat type

Sampling Pros Vs. Cons: too shallow to set a trammel net except in channel. Easy access. Boat supplied by park has several holes.

Comments:

Fallkill Creek (below dam)

Habitat Description: lower gradient, slow flowing except right below dam; large rocks right below dam, otherwise silty, soft-bottomed; somewhat channelized; edges lined by trees and brush representative of a wetland area. Water clarity poor with a dark stained color.

Habitat Stratification: all one habitat type

Sampling Pros Vs. Cons: Easiest place to sample is just below dam; however this can be quite a spectator event for visitors. Farther downstream becomes difficult with due to coarse woody debris. Electrofishing would probably be difficult due to poor water clarity, depth, and bottom type. Seine pull was difficult due to bottom debris.

Comments:

Meriches Kill**Habitat Description:**

Lower Meriches Kill- low gradient, slower flowing, riffles and pools, silt, gravel substrate; channelized; lined by a forest canopy on one side and grassy wetlands on other side. This part of stream is not completely shaded; water clarity good

Upper Meriches Kill- moderate to higher gradient; faster flowing; riffles, runs, pools; rock, cobble substrate; pools with softer, silty bottoms; approximately (5-10 feet wide); water clarity good; under forest canopy; stream above Roosevelt Ice pond remains pretty similar to below with exception of greatly increased amount of coarse, woody debris (a lot of fallen trees)

Habitat Stratification: Lower and Upper Meriches Kill could be considered two separate habitat types

Sampling Pros Vs. Cons: easy access by the trail below Roosevelt Ice Pond; no trail access above Roosevelt Ice Pond

Comments: trail crosses stream and stream runs through culvert in Lower Meriches; trail crosses stream again just below Ice Pond.

Crum Elbow Creek

Habitat Description: higher gradient; fast-flowing; rock, cobble substrate; riffles, runs, and pools (substrate similar for all); under forest canopy; water clarity good

Habitat Stratification: one habitat type

Sampling Pros Vs. Cons: flow is almost too fast for walking in stream, especially close to dam

Comments: Korkers necessary for walking in stream; tour road runs along length of Creek; between middle pond and lower pond is a bridge that currently appears to be under construction. Another bridge crosses between middle and upper pond.

Middle Pond

Habitat Description: high flow impoundment steep sided banks and edges; gravel bottomed along edges at lower dam; softer bottom in middle; mostly grassy banks with a small amount of emergent vegetation; dark stained water color; lawn comes to edge of pond

Habitat Stratification: one habitat type

Sampling Pros Vs. Cons: steep sided edges make it difficult to get very far apart with seine; a lot of leaf debris in seine made it difficult to see fish; high flow was reason for only using seine; easy access.

Comments: tour road runs along one side

Upper Pond

Habitat Description: similar to middle pond but has more submergent vegetation; not as steep sided and edge doesn't drop off as fast; lawn comes right to edge of pond on one side, rest of pond edge is either heavily wooded with under brush or not densely wooded.

Habitat Stratification: one habitat type

Sampling Pros Vs. Cons: easy access; difficult to pull seine; did not set other nets because of high flow potential

Comments:

Resources Not Sampled

Lower Pond: not sampled; potential for high, fast flow; sides had a curbed edge; seems to have a silty or gravelly bottom.

Roosevelt Ice Pond: not sampled; a lot of coarse woody debris; high flow potential; steep-sided and edge drops off quickly on one side; water clarity not great; drop off and sides not as steep on other side.

Roosevelt Cove: not sampled (low priority); heavily vegetated with emergents; extremely, mucky, soft bottom; poor water clarity; tidally influenced from Hudson River through a culvert that runs under railroad system (parallels cove).

Upper Fallkill Creek: not sampled; appears to be similar to Upper Valkill Pond

Lower Valkill Pond: never saw this one

Massachusetts Cooperative Fish and Wildlife Research UnitNortheast National Park Freshwater Fish InventoryAppendixSampling NotesSaratoga National Historical ParkMill Creek**A. Habitat Description:**

1. **Main Branch (south and main confluence):** low flow; mostly pools connected by small runs; rock, cobble substrate, and some exposed bedrock; under forest canopy with some under brush; wider flood plain bordered by steep sided hills.
2. **South Branch:** lower portion similar to main branch, except most pools are connected by barely there trickles or no water at all. No flow in lower portion. Flood plain gradually narrows and stream runs through steep sided ravine. No flow through this section either primarily disconnected pools. With flowing water, it would probably be a series of falls, plunge pools, runs, and riffles. Substrate primarily rock, cobble, and some exposed bedrock. Under forest canopy with no underbrush. In upper portion of ravine there appears to be some flow however very low. Coming out of ravine substrate becomes more of a gravel, rock substrate, lower gradient, channelized stream. Above ravine stream flows through wetlands of thick, dense brush and becomes silty, moderately soft-bottomed. Below culvert stream channel becomes indistinguishable, and looks more like a marshy wetland. Above Tour Road becomes very narrow and channelized and runs through a grassy wetlands.
3. **Main Branch (middle and main confluence):** slow flow; silty, gravelly bottom wider below confluence than above; trees and brush; about 35 m above confluence water flow abruptly decreases to a trickle. Some grassy vegetation appears in stream above confluence. Above this point stream becomes an extremely narrow, soft-bottomed channel running through grasses with little to no flow. At trail crossing water pools but does not appear to be flowing. Farther upstream at road, stream was dry.
4. **Middle Branch:** Channelized stream runs through a wetland; a lot of thick brush; gradually becomes less channelized and thick brush disappears leaving just forest canopy; soft bottom changes to rock, cobble bottom. Some stretches of coarse woody debris; becomes thick, dense and impassable with brush; above this section stream flows through steep sided ravine with forest canopy and has rock, cobble bottom, and some exposed bedrock with a flow runs and pools; then flows through grassy wetland up to Tour Road and beyond.

B. Habitat Stratification:

1. silty bottom in wetland area
2. cobble, rock bottom under forest canopy
3. ravine sections

C. Sampling Pros Vs. Cons:

1. **Main Branch (south and main confluence):** difficult access, involving long walk; low flow at this time
2. **South Branch:** low flow at this time; upper section becomes impassable due to thick dense brush.
3. **Main Branch (middle and main confluence):** confluence not a far walk from the trail; fairly easy access
4. **Middle Branch:** very long difficult walk with equipment from confluence upstream to trail. Lost view of stream because brush was so thick. Recommend a good topographic map and compass for this area.

D. Comments:

1. **Main Branch (south and main confluence):** majority of main branch could not be sampled due to private property inholdings where the stream ran through.
2. **South Branch:** Passes under both sections of the Tour Road through a culvert. Majority of upper portion not sampled because of thickness of brush. Areas that could have been sampled were not significantly different from last transect done on this branch.
3. **Main Branch (middle and main confluence):** fish sizes are extremely small; nothing was more than 40-50 mm long.
4. **Middle Branch:** Passes under both sections of the Tour Road through a culvert.

Kroma Kill**A. Habitat Description:**

1. **Lower Kroma Kill:** soft clay substrate; channelized; riparian zone primarily trees and underbrush stream open to sunlight. Rock, cobble begins to appear in substrate of upper transects. Low gradient, low flow, deep, channelized pools connected by slow flowing channelized sections. Water clarity poor a very cloudy, milky (cream), opaque color.
2. **Upper Kroma Kill (above entrance road bridge):** Higher gradient, faster flowing; rock, cobble substrate; not as channelized; riparian zone similar; shallower with a riffle, run type of flow. Transect 11 included a waterfall of much higher gradient than actual stream, wider than stream substrate was primarily exposed bedrock. Fast flowing, pool, run sequences; low water level. Above waterfall becomes similar to Lower Kroma Kill, but with a rock, cobble substrate, and deep pools.

B. Habitat Stratification: Upper Kroma Kill, Lower Kroma Kill, waterfalls**C. Sampling Pros Vs. Cons:** Water clarity in deeper sections might decrease catchability; some pools too deep to walk and electrofish; walking along sides of stream easy.**D. Comments:** water flow seems to be inhibited by culvert upstream of waterfall; entrance road runs along stream; heavy construction currently taking place on entrance road to culverts and drains in along road. At fork of Kroma Kill, branch that runs into park is dry from confluence to upstream road crossing due to damming from road construction. This dam has created a pool upstream of road. Above that stream is very narrow, low and slow flowing and runs right along road appearing to be nothing more than a drainage ditch. Upstream of confluence, section that runs out of park not

appearing to have water clarity as poor as downstream sections. Water clarity much poorer this year than year before.

Old Champlain Canal

A. Habitat Description:

1. **Section 1 (stop 10):** steep sided channel; poor water clarity; very soft, mucky bottom; about 20-25 feet across and less than a meter deep at deepest section. Lower portion runs into a narrow channel that flows into a stream that flows toward Hudson River. Above bridge water level becomes increasingly shallow until it appears to be mostly a marshy wetlands up to the entrance road.
2. **Section 2:** similar to stop 10 a riparian zone of dense shrubs and brush; heavily vegetated; dark stained water.
3. **Section 3:** similar to stop 10 but much shallower; similar width
4. **Section 4:** extremely narrow (approximately 1-2 feet across) and shallow with a soft, mucky bottom.
5. **Section 5 (south section):** similar to stop 10; had emergent, submergent, and floating vegetation; water was a dark stained color; a lot of coarse woody debris; similar width to stop 10, unsure about depth.

B. Habitat Stratification:

1. Section 1
2. Section 2
3. Section 3
4. Section 4
5. Section 5

C. Sampling Pros Vs. Cons:

1. **Section 1:** easiest access for boat and gear;
2. **Section 2:** difficult access (thick brush);
3. **Section 3:** difficult access (thick brush); too shallow for anything more than minnow traps
4. **Section 4:** too shallow and narrow for any gear we had
5. **Section 5:** easy access complicated only by dense zone of emergent **vegetation**; lot of coarse woody debris that might interfere with nets and boat movement.

D. Comments:

1. **Section 1:** Beaver dam from year before had blown out causing significant drop in water level; trail runs along one side of canal from the middle to lower section and on both sides of upper section creating a buffer from the thick brush and trees; where the trail isn't directly along the canal it is bordered by thick brush and trees.
2. **Section 2:**
3. **Section 3:**
4. **Section 4:** section 4 connected to American River and then runs through culvert under Rt. 4; unable to determine if this was connected to section 5
5. **Section 5:**

Davidson's Farm Pond

- A. **Habitat Description:** small pond with very soft, mucky bottom; water clarity poor; emergent vegetation around $\frac{3}{4}$ of pond; drops off fast from edge.
- B. **Habitat Stratification:** all one habitat.
- C. **Sampling Pros Vs. Cons:** too small for a trammel net
- D. **Comments:** According to map Middle branch of Mill Creek appears to run nearby pond (did not actually see); could be a connection to pond, but did not actually see.

Burdil's Farm Pond

- A. **Habitat Description:** larger than Davidson's; completely surrounded by emergent vegetation; soft, mucky bottom; drops off fast from edge.
- B. **Habitat Stratification:** all one habitat and similar to Davidson's Pond
- C. **Sampling Pros Vs. Cons:** too small for a trammel net; difficult to set fyke nets from shore due to steep drop from edge.
- D. **Comments:**

American River

- A. **Habitat Description:** channelized, low gradient, slow flowing, mucky, soft-bottomed. Lot of leaf debris; lined by thick, dense brush and some trees
- B. **Habitat Stratification:** appears to be pretty similar throughout
- C. **Sampling Pros Vs. Cons:** water level very low could be why we got no fish; access to lower section of river easy from Rt. 4.
- D. **Comments:** It appears that canal and river join and flow together. According to map, American River flows into Hudson River. Was not clear where river flowed from below Rt. 4 culvert.

Devil's Hollow

- A. **Habitat Description:**
 - 1. **Upper Devil's Hollow:** There are two branches of similar habitat; low gradient; slow flowing, soft-bottomed; riparian zone is thick, dense brush with some trees; beyond this are mowed pastures.
 - 2. **Lower Devil's Hollow:** According to last years trip, this section was at the bottom of a very steep sided ravine similar to south branch of Mill Creek, under forest canopy, exposed bedrock substrate
- B. **Habitat Stratification:** at least two habitats are present as listed above.
- C. **Sampling Pros Vs. Cons:** thick brush in Upper Devil's Hollow would be a hindrance to sampling. Steepness of ravine would be a complication for access to lower section.
- D. **Comments:** was low on priority list of resources to sample, due to access issues did not actually sample

Vly Pond

- A. **Habitat Description:** wetland pond with a lot of coarse woody debris
- B. **Habitat Stratification:** all one habitat

- C. **Sampling Pros Vs. Cons:** boat may not be usable with the amount of debris in pond; could not set most gear because of debris; minnow traps might be possible.
- D. **Comments:** May be connected to the Hudson River

Service Road Pond

- A. **Habitat Description:** wetland pond with a lot of coarse woody debris, emergent vegetation, and soft bottom; does not appear to have an inflow or outflow
- B. **Habitat Stratification:** all one habitat
- C. **Sampling Pros Vs. Cons:** too small for boat bigger than a rowboat; could not set anything more than minnow traps
- D. **Comments:** low on priority list; did not know about this resource until we arrived for sampling

Tour Road Pond

- A. **Habitat Description:** supposedly just off tour road near the entrance; could not see where it was.
- B. **Habitat Stratification:**
- C. **Sampling Pros Vs. Cons:**
- D. **Comments:**

Rt. 4 Culvert Pond

- A. **Habitat Description:** think just a backwater from the Hudson River
- B. **Habitat Stratification:**
- C. **Sampling Pros Vs. Cons:**
- D. **Comments:** only saw on drive with Chris Martin; was low on priority list; did not know it was on list until we arrived.

River Road Pond

- A. **Habitat Description:** wetland pool with coarse woody debris connected to Hudson River
- B. **Habitat Stratification:** all one habitat
- C. **Sampling Pros Vs. Cons:** boat would be difficult to use; nets would be difficult to set because of debris; minnow traps might be possible
- D. **Comments:** narrowly separated from Hudson by the width of a road.

Massachusetts Cooperative Fish and Wildlife Research Unit**Northeast National Park Freshwater Fish Inventory****Appendix****Sampling Notes****Saint Gaudens National Historic Site****Blow-me-down Pond**

- A. Habitat Description:** Actually impounded section of Blow-me-down Brook. Has a lot of coarse woody debris. Upper Pond edge (across from access) primarily lined with purple loose strife and submergent vegetation backed by tree line. Upper Pond (on access side) steeper sided and lined by narrower edge of vegetation, no significant amount of submergent vegetation backed by a mowed field. Above Blow-me-down Brook connection is a shallow, soft-bottomed backwater with dense submergent vegetation changing to grasses around edge. Lower Pond (across from access) becomes steep sided and edge is lined by trees and maybe thick brush. Amount of submergent vegetation greatly decreases. Lower Pond (access side) remains steep-sided, but has more submergent vegetation backed by tall grasses and mowed field. Entire bottom is soft. It appears to be uneven due to channel of flow. Considered it a high flow impoundment.
- B. Habitat Stratification:** Primarily sampled upper pond due to effects of flow on gear and boat. Sampled shallow, vegetated backwater at mouth of brook, middle of channel, shallow, submerged vegetation area, unvegetated, steep-sided area.
- C. Sampling Pros Vs. Cons:** Easy access. Too steep-sided and soft-bottomed for seining. Flow could be a concern for setting gear.
- D. Comments:** Heard the tail slaps of beaver. Saw at least 1 beaver swimming.

Blow-me-down Brook

- A. Habitat Description**
- 1. High flow:** Wider, high flow, rock, cobble bottom. Banks undercut. Sycamore grove lines brook on private property side. Tree line consisting of forest canopy is set slightly back from stream. Grasses and thick shrub directly line stream. Mostly shallow with some sections along edge being deeper from undercutting.
 - 2. Low flow:** Channelized, lower flow, silty bottom, shallow with deeper pools around edge. Lined with heavy dense brush backed by forest canopy.
- B. Habitat Stratification:** Sampled in higher flow section. Did not sample low flow section due to similarity with pond.
- C. Sampling Pros Vs. Cons:** Higher flow section difficult to sample due to current. Difficult to move against current and catch fish. Seining might be possible in lower flow section, however deeper pools where fish would most likely be would be difficult to get into. Places to pull seine in on shore would be minimal. Some sections of high flow were not sampled due to depth combined with flow.

- D. Comments:** Most fish sampled from this stream were covered with dark black spots, possibly from disease. Saw 1 beaver in lower flow section.

Blow-me-up Brook

- A. Habitat Description:** Narrower, higher gradient, primarily fast flowing runs with occasional falls and plunge pools. Substrate primarily cobble, rock and exposed bedrock. Lower part of brook under forest canopy, channelized with exposed flood plain changing to steep sided ravine. Just below bridge and dam area brook flows into an extremely steep sided ravine with no flood plain in between. Upstream of bridge, flood plain returns between stream and ravine. Ravine still very steep sided.
- B. Habitat Stratification:** Considered whole stream to have similar habitat.
- C. Sampling Pros Vs. Cons:** Could not sample large pool directly below bridge due to depth and flow. Could not sample section flowing through ravine because of flow and impossible access.
- D. Comments:**

Farm Pond

- A. Habitat Description:** Small, steep-sided pond at edge of treeline. Most of pond is bordered by pasture. End of pond that borders treeline has emergent grassy vegetation. Brook flows into pond from treeline side. Outflow pipe directly across pond from inflow pipe. Depth about 8-10 feet.
- B. Habitat Stratification:** Small enough to be considered one habitat.
- C. Sampling Pros Vs. Cons:** Too small for trammel net and too steep-sided for seining.
- D. Comments:** The manager told us that there are yellow perch and at least one 3.5 lbs. Largemouth bass in pond.

Massachusetts Cooperative Fish and Wildlife Research Unit**Northeast National Park Freshwater Fish Inventory****Appendix****Sampling Notes****Minuteman National Historical Park****Farm Pond (Palumbo's)**

- A. Habitat Description:** Located in a field that is currently being farmed. Pond is completely surrounded by a steep sided bank and connected at one end to canal system that is used for field drainage. Lined by either a thin zone of brush or grasses. Emergent vegetation lines littoral zone around connection to canal. Floating vegetation coats the entire pond. Bottom is very soft and mucky.
- B. Habitat Stratification:** Decided that the whole pond is basically one habitat.
- C. Sampling Pros Vs. Cons:** Decided against using trammel net due to the small size of pond
- D. Comments:** Due to years of runoff from a field subject to fertilizer use, disturbance of sediment could be a safety issue for sampling. For this reason, precautions should be taken in sampling that disturbs sediments.

Mill Creek (North Bridge Unit)

- A. Habitat Description:**
- 1. Wide section:** submerged, grassy vegetation; fairly deep (~.5-1 m); channelized; lower gradient, slow-flowing; many smaller channels emptying into main channel, some are almost dry, others are still holding water. Treeline up to bank of stream on opposite side. Side we sampled on was composed of a grassy wetland.
 - 2. Narrow section:** similar to wide section in submerged vegetation, depth, gradient, flow, channelization, and peripheral channels. Both sides of stream are lined by grassy wetland.
- B. Habitat Stratification:** Could be considered two different habitat types based on the width and riparian zone.
- C. Sampling Pros Vs. Cons:** Depth of stream does not allow walking through stream to sample. Electrofishing done from sides. Water clarity poor, making it difficult to see if fish were there or not. Fish could have been falling to bottom, and we wouldn't have known it. Walking through wetlands dangerous because of deep holes concealed by grasses. Thickness of vegetation along sides could have also been concealing fish from our view.
- D. Comments:** Park boundary borders and lumberyard. It appears that the creek runs underneath this lumberyard. Unsure how this might affect fish passage. Surface water appears to have an oily residue. Small dam-like structure in transect 2, which could be beavers. Another beaver dam at mouth of Mill, which is causing a back up of water in

lower area of creek. Did not actually see. During spring the wetlands area is generally covered by water.

Mill Creek (Wayside Site)

A. Habitat Description: Water depth and substrate, similar to narrow section of North Bridge Unit. Increased amount and thickness of submerged vegetation. Thicker vegetation and higher grasses along edges of stream

B. Habitat Stratification: Decided that this area was one habitat type. Could be considered the same type of habitat as the North Bridge Unit section.

C. Sampling Pros Vs. Cons: Access to stream difficult. Cannot sample stream completely due to the depth, width, and thickness of submerged vegetation. All sampling was done from bank.

D. Comments: Park boundaries unmarked. Section that is most obviously within park boundaries abuts private property. We were asked to avoid sampling this section. Directly upstream of this section, there is road construction occurring on road and bridge that crosses this stream.

Mill Creek (Palumbo's)

A. Habitat Description: Did not actually see Mill Creek due to beaver dam. Appears to flow by the bottom of Palumbo's farm through a thin section of trees. There are fields on both sides of creek.

B. Habitat Stratification: Not possible at this time.

C. Sampling Pros Vs. Cons: Access at this time not possible.

D. Comments: At this time the beaver dam was creating so much water back up that most of the lower half of Palumbo's fields were under 4-6 inches of water. Manager mentioned that access to Mill Creek Confluence could involve a lot of bushwhacking and did not appear to be important.

Mill Creek Tributary

A. Habitat Description:

- 1. Upstream of culvert:** A wider, flattened out, shallower channel the downstream of culvert. A lot of leaf and coarse woody debris. Stream maintains this type of appearance for about 50-75 m. At this point it becomes narrower, less channelized and the water level becomes increasingly shallow. Bottom has a thin organic covering, beneath which it seems fairly solid. Absolutely no flow of water through culvert. Water above culvert completely stagnant. Riparian zone consists of forest canopy with dense underbrush right up to stream edges for first 50-75 m. When stream narrows, the left side (if facing upstream) opens up into a grassy wetland. Right side appears to maintain the forest canopy and dense underbrush. Section that flows on other side of visitor parking area, farther upstream appears to be completely dry.
- 2. Downstream of culvert:** Little to no water in this section. Stream bed still wet and mucky. Does not appear to have the same features as upstream of the culvert. Might be more similar to the Wayside Section of the Mill Creek. Directly beneath culvert stream flows through thick brush and eventually changes to forest canopy.

- B. Habitat Stratification:** Sampling here depended on the presence of water. Therefore, we could only sampled upstream of the culvert.
- C. Sampling Pros Vs. Cons:** Upstream of culvert easily sampled. Downstream of culvert does not maintain water year round. Therefore, we could not sample it at this time of year.
- D. Comments:** Amount of decaying material and lack of flow could be important to maintaining life upstream of culvert year-round. Manager mentioned that culvert was installed improperly. The culvert does not allow water to flow downstream after the water level drops below a certain point.

Elm Creek (see original notes and map for more information)

A. Habitat Description

- 1. Downstream of 2A:** Narrow, lower gradient stream with a thin organic covering over a sandy/gravel bottom flowing through a purple loose strife and other invasive species wetland. Stream edges surrounded by dense brush. Brush also acts a relatively thick cover. Surrounding wetlands area underwater part of the year
- 2. Upstream of 2A:** Wider, higher gradient stream with a gravel bottom in lower portion changing to a rock, cobble substrate with the occasional boulder farther upstream. Riffle, pool sequences with a small waterfall around boulder. Also has some large, coarse, woody debris. Under forest canopy with very little brush.

B. Habitat Stratification: Based on description above the habitat was divided into 2 types.

C. Sampling Pros Vs. Cons:

- 1. Downstream of 2A:** one electrofishing transect of 22 m was completed in this habitat type starting just upstream from boardwalk bridge. Majority of sampling was done from sides and only where we could get through brush to get equipment into stream. Due to the thickness of the brush no further electrofishing could be done without some serious habitat alteration. Sampling downstream of boardwalk was also not done due to thickness of brush.
- 2. Upstream of 2A:** Two 25 m transects were done. Stopped at this point because we got no new species in last transect. Also, park boundaries are not marked. Possible fish barrier down stream. However, more electrofishing could easily be done upstream.

D. Comments: Park boundaries are not marked at either end.

- 1. Downstream of 2A:** Trail passes through wetlands and over stream on a raised boardwalk.
- 2. Upstream of 2A:** Stone block wall (possibly manmade) across stream acting as a possible fish barrier especially during low to moderate water levels. This would be more of an issue for fish moving upstream than downstream.

Unnamed Pond (Visitor's Center)

- A. Habitat Description:** Manmade pond with a bank all the way around, except for small beach area. Sidewalk side of pond is lined with a thin zone of trees and brush separated by unvegetated areas. Other side of pond is lined with a much thicker (density and width) zone of trees and brush. Littoral zone appears to be primarily

- gravel bottomed. No submergent, emergent, or floating vegetation.
- B. Habitat Stratification:** Decided that pond habitat was basically similar all the way around, with the exception of the unvegetated riparian areas vs. vegetated riparian areas.
 - C. Gear Placement (see data map):** Placed fyke nets in areas of transition between vegetated and unvegetated areas. Sampled primarily along sidewalk side due to accessibility. Minnow traps were set in both vegetated and unvegetated areas.
 - D. Sampling Pros Vs. Cons:** Decided against use of trammel net due to the small size of pond and coarse woody debris. Very easy to sample.
 - E. Comments:** Fish are fed by park visitors, probably due to close proximity of pond to sidewalk and picnic areas. Recreational fishing by small children was mentioned. Crayfish caught in nets were very large some were > 100 mm from tail to rostrum.

Folly Pond

- A. Habitat Description:** Pond is an isolated basin and originally functioned as a manmade farm pond. North and west sides of pond lined by trees. Rest of pond is lined by grassy wetlands with tree line set back. Extremely soft bottomed and steep sided banks on tree lined side. Surface covered by floating vegetation.
- B. Habitat Stratification:** Could be considered two habitat types but side that borders wetlands not accessible.
- C. Sampling Pros Vs. Cons:** Access complications due to proximity to Route 2A and safety issues from the dump site. Decided against use of boat and trammel net in pond due to small size, safety issues and potentially hazardous debris.
- D. Comments:** Approximately half of pond appears to have dried up. Pond bottom of this area appears to be mucky. Area around pond initially functioned as a farm dump and was then used as a town dump for solid wastes. A section of trees within 15-20 feet of pond was dead. Access to pond could be a safety issue particularly at night due to remnant debris from dump, i.e. glass bottles, cans, shattered glass, etc. Use of a boat in pond could be a safety issue due to potential of submerged debris. Debris in shallows consisted of several old tires, an axle, etc.

Ephemereal Stream (Visitor's Center)

- A. Habitat Description:** Stream bed is set in forest canopy. No water at this time of year. Stream bottom still mucky and wet. Appears that it would be a lower gradient, narrow, shallow, low-flow stream.
- B. Habitat Stratification:** No need to stratify due to lack of water.
- C. Sampling Pros Vs. Cons:** No water at this time of year.
- D. Comments:** Does not appear to connect to pond. Flows between parking area and Unnamed Pond. Stream passes under boardwalk that leads to Visitor's Center.

Unnamed Brook (North Bridge Unit)

- A. Habitat Description:** Mouth area of stream under forest canopy is a lower gradient, with a semi-soft, silty bottom. Coarse woody debris across mouth of stream. Farther upstream gradually becomes enclosed by extremely thick brush (multiflora rose, etc.) with a rock, cobble substrate. This habitat type continues upstream to bridge and above bridge.

- B. Habitat Stratification:** Could be considered 2 habitat types. One type is unsampleable due to thickness of brush. Other type was sampled.
- C. Sampling Pros Vs. Cons:** Sampling difficult due to amount of fallen leaf debris in stream. Could not complete EF2 due to thickness of brush.
- D. Comments:** Noticed oily residue on surface of water. Only a small section of stream is sampleable with electrofishing due to thickness of brush. Sewage leaching field and maintenance facility is just up hill from stream. No fish were found in stream. This seems unusual, because there is a direct connection to a source (Concord River). Park boundary just upstream of Liberty Street Bridge.

Massachusetts Cooperative Fish and Wildlife Research UnitNortheast National Park Freshwater Fish InventoryAppendixSampling JournalWeir Farm National Historic Site

9/18/00-

<u>Stream/ Pond Name</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Weir Pond	Day	3 FN	Largemouth Bass (5) Pumpkinseed (1)
Weir Pond	Day	TN 1.5	Pumpkinseed (8)
Weir Pond	Day	15 MT	YOY Pumpkinseed (21)
Weir Pond	Day	Spin Rod	Largemouth Bass (5)
Weir Pond	Night	3 FN	Pumpkinseed (2)
Weir Pond	Night	TN 1.5	Pumpkinseed (8)
Weir Pond	Night	15 MT	YOY Pumpkinseed (45)
Weir Pond	Night	Spin Rod	Largemouth Bass (1)

9/19/00-

<u>Stream/ Pond Name</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Weir Pond	Night	3 FN	Pumpkinseed (20) American Eel (1)
Weir Pond	Night	TN 1.5	Pumpkinseed (12)
Weir Pond	Night	15 MT	Pumpkinseed (28)
Weir Pond	Night	Spin Rod	Largemouth Bass (2)

9/20/00-

<u>Stream/ Pond Name</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Weir Pond	Night	5 FN	Pumpkinseed (10) Largemouth Bass (7)
Weir Pond	Night	TN 1.5	Pumpkinseed (7)
Weir Pond	Night	15 MT	YOY Pumpkinseed (15)
Weir Pond	Night	Spin Rod	Largemouth Bass (5)

Massachusetts Cooperative Fish and Wildlife Research Unit**Northeast National Park Freshwater Fish Inventory****Appendix****Sampling Journal****Marsh Billings Rockefeller National Historical Park**

9/26/00-

<u>Stream/ Pond Name</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Pogue	Day	3 FN	No Fish Found
Pogue	Day	15 MT	No Fish Found
Pogue	Day	TN 1.5	Largemouth Bass (1)
Pogue	Night	3 FN	YOY Largemouth Bass (1)
Pogue	Night	15 MT	YOY Largemouth Bass (1)
Pogue	Night	TN 1.5	Yellow Perch (1)
Pogue	Night	TN 1.5	Largemouth Bass (1)

9/27/00-

<u>Stream/ Pond Name</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Pogue	Day	5 FN	No Fish Found
Pogue	Day	15 MT	No Fish Found
Pogue	Day	TN 1	Yellow Perch (3)
			Largemouth Bass (2)
Pogue	Day	TN 1.5	Largemouth Bass (2)
Pogue	Night	TN 1	No Fish Found
Pogue	Night	TN 1.5	Yellow Perch (2)

9/27/00-9/28/00

<u>Stream/ Pond Name</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Pogue	Overnight	5 FN	Largemouth Bass (1)
Pogue	Overnight	15 MT	YOY Largemouth Bass (1)

Massachusetts Cooperative Fish and Wildlife Research Unit**Northeast National Park Freshwater Fish Inventory****Appendix****Sampling Journal****Morristown National Historical Park****10/02/00-**

<u>Stream/ Pond Name</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Indian Grave Brook	Day	EF 1	Rainbow Trout (8) Spottail Shiner (2) Blacknose Dace (14) Creek Chub (1)
Indian Grave Brook	Day	EF 2	Rainbow Trout (2) Blacknose Dace (23) Spottail Shiner (2)
Indian Grave Brook	Day	EF 3	Rainbow Trout (3) Spottail Shiner (3) Blacknose Dace (9)
Indian Grave Brook	Day	EF 4	Rainbow Trout (6) Blacknose Dace (14) Brown Trout (3) Spottail Shiner (2)

10/03/00-

<u>Stream/ Pond Name</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Passaic River	Day	EF 1	Blacknose Dace (8) Spottail Shiner (2) Brook Trout (3) Creek Chubsucker (1) Brown Trout (3)
Passaic River	Day	EF 2	Rainbow Trout (6) Blacknose Dace (2) Rainbow Trout (11) Brown Trout (1) Spottail Shiner (1) Tessellated Darter (1)
Passaic River	Day	EF Pool	Blacknose Dace (1)
Passaic River	Day	EF 3	Blacknose Dace (6) Creek Chub (2) Rainbow Trout (3)

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Passaic River	Day	EF 4	Brown Trout (1) Rainbow Trout (9) Blacknose Dace (16) Brown Trout (1) Spottail Shiner (2) Creek Chub (1)
Passaic River	Day	EF 5	Rainbow Trout (15) Blacknose Dace (10) Spottail Shiner (5) Brown Trout (3)
Passaic River	Day	EF 6	Blacknose Dace (7) Rainbow Trout (4) Spottail Shiner (7)
Passaic River	Day	EF 7	Blacknose Dace (12) Rainbow Trout (7) Brown Trout (7) Creek Chub (1)
Passaic River	Day	EF 8	Blacknose Dace (12) Rainbow Trout (4) Brown Trout (1)
Cat Swamp Pond	Day	5 FN	Golden Shiner (529)
Cat Swamp Pond	Day	15 MT	Golden Shiner (401)
Primrose (Main Branch)	Day	EF 1	Sculpin (12) Brook Trout (3) Spottail Shiner (2) Blacknose Dace (4)
Primrose (Main Branch)	Day	EF 2	Blacknose Dace (6) Brook Trout (4) Sculpin (10) Spottail Shiner (1)
Primrose (Main Branch)	Day	EF 3	Brook Trout (4) Sculpin (8) Blacknose Dace (4)
Primrose (Main Branch)	Day	EF 4	Spottail Shiner (1) Creek Chub (1) Brook Trout (6) Sculpin (5) Blacknose Dace (1)
Primrose (Main Branch)	Day	EF 5	Sculpin (19) Blacknose Dace (2) Brook Trout (2)
Primrose (Main Branch)	Day	EF 6	Brook Trout (7) Sculpin (31) Creek Chub (3) Spottail Shiner (4) Blacknose Dace (1)

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Primrose (Main)	Day	EF 7	Brook Trout (4) Blacknose Dace (3) Sculpin (7)
Primrose (Main)	Day	EF 8	Spottail Shiner (1) Sculpin (18) Brook Trout (1) Blacknose Dace (3) Sculpin (9) Brook trout (3) Blacknose Dace (1) YOY Brook Trout (1)
West Primrose	Day	EF 1	Brook Trout (8) Blacknose Dace (2) Sculpin (5) YOY Brook Trout (1) Brook Trout (3) Sculpin (7) Blacknose Dace (1) YOY Brook Trout (1)
West Primrose	Day	EF 2	Brook Trout (1) Sculpin (3) Sculpin (5) Brook Trout (2) Brook Trout (5) Sculpin (6) Blacknose Dace (2) YOY Blacknose Dace (1)
West Primrose	Day	EF 3	Sculpin (7) Blacknose Dace (1) YOY Brook Trout (1) Brook Trout (1) Sculpin (3) Sculpin (5) Brook Trout (2) Brook Trout (5) Sculpin (6) Blacknose Dace (2) YOY Blacknose Dace (1)
West Primrose	Day	EF 4	Sculpin (7) Blacknose Dace (1) Blacknose Dace (9) Sculpin (4) Spottail Shiner (1)
East Primrose	Day	EF 1	
East Primrose	Day	EF 2	
East Primrose	Day	EF 3	
East Primrose	Day	EF 4	

10/04/00-

<u>Name</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Jersey	Day	EF 1	Spottail Shiner (5) Blacknose Dace (1) Sculpin (1)
Jersey	Day	EF 2	Blacknose Dace (2)
West Primrose	Day	EF 5	Blacknose Dace (1) Sculpin (7)
West Primrose	Day	EF 6	Brook Trout (3) Blacknose Dace (2) Sculpin (2)
West Primrose	Day	EF 7	Brook Trout (3)

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SAMPLING JOURNAL: MORRISTOWN

West Primrose	Day	EF 8	Blacknose Dace (5) Sculpin (2) Sculpin (12) Blacknose Dace (4) Brook Trout (2)
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10/05/00-

<u>Stream/ Pond Name</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Indian Grave Brook	Day	EF 5	Blacknose Dace (19) Rainbow Trout (2) Creek Chub (5) Spottail Shiner (12)
Indian Grave Brook	Day	EF 6	Rainbow Trout (3) Spottail Shiner (7) Creek Chub (1) Blacknose Dace (21)
Indian Grave Brook	Day	EF 7	Blacknose Dace (19) Rainbow Trout (7) Spottail Shiner (27)
Indian Grave Brook	Day	EF 8	Blacknose Dace (18) Rainbow Trout (3) Spottail Shiner (30) Bluegill (1)

Massachusetts Cooperative Fish and Wildlife Research Unit**Northeast National Park Freshwater Fish Inventory****Appendix****Sampling Journal****Roosevelt Vanderbilt National Historic Sites****10/09/00-**

<u>Stream/ Pond Name</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Upper Valkill Pond	Day	3 FN	Blue Gill (15) Redfin Pickerel (1)
Upper Valkill Pond	Day	15 MT	Redfin Pickerel (1)
Upper Valkill Pond	Day	TN 1.5	White Sucker (4)
Upper Valkill Pond	Night	3 FN	No Fish Found
Upper Valkill Pond	Night	15 MT	No Fish Found
Upper Valkill Pond	Night	TN 1.5	White Sucker (3) Brown Bullhead (1)

10/10/00-

<u>Stream/ Pond Name</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Crum Elbow Creek	Day	EF 1	Blacknose Dace (10) Creek Chubsucker (2) American Eel (not counted)
Crum Elbow Creek	Day	EF 2	Blacknose Dace (18) Redbreasted Sunfish (1) Creek Chubsucker (3) American Eel
Crum Elbow Creek	Day	EF 3	Blacknose Dace (4) Redbreasted Sunfish (7) American Eel (3) Rock Bass (3) Creek Chubsucker (4)
Middle Pond (Vanderbilt)	Day	BS 1	Pumpkinseed (1) Largemouth Bass (1) YOY Sunfish (1)
Middle Pond (Vanderbilt)	Day	BS 2	Largemouth Bass (1)
Middle Pond (Vanderbilt)	Day	BS 4	Redfin Pickerel (2) Pumpkinseed (4) Largemouth Bass (4) Chain Pickerel (1) Rock Bass (2)

YOY Sunfish (1)

10/10/00-10/11/00

<u>Stream/ Pond Name</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Upper Valkill Pond	Overnight	3 FN	Blue Gill (2) Rock Bass (1)

10/11/00-

<u>Stream/ Pond Name</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Meriches Kill	Day	EF 1	Johnny Darter (9) Mummichog (56) Banded Killifish (1) American Eel (3) YOY Sunfish (1) Pumpkinseed (3) Redbreasted Sunfish (4)
Meriches Kill	Day	EF 2	Johnny Darter (9) Redbreasted Sunfish (21) Mummichog (12) White Sucker (2) Redfin Pickerel (1) YOY Sunfish (2) Johnny Darter (4) American Eel (estimate >30)
Meriches Kill	Day	EF 3	Blacknose Dace (8) American Eel (not counted)
Meriches Kill	Day	EF 4	Blacknose Dace (7) American Eel (not counted)
Meriches Kill	Day	EF 5	Blacknose Dace (73) White Sucker (1) American Eel (not counted)
Meriches Kill	Day	EF 6	Blacknose Dace (19) American Eel (not counted)
Meriches Kill	Day	EF 7	Blacknose Dace (53) White Sucker (3) Spottail Shiner (1) American Eel (not counted)
Meriches Kill	Day	EF 8	Blacknose Dace (63) American Eel (not counted)
Meriches Kill	Day	EF 9	Blacknose Dace (54) American Eel (not counted)

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SAMPLING JOURNAL: ROOSEVELT VANDERBILT

10/12/00-

<u>Stream/ Pond Name</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Lower Falkill Creek	Day	Seine	Redfin Pickerel (1) Redbreasted Sunfish (1)
Meriches Kill	Day	EF 10	Blacknose Dace (38)
Meriches Kill	Day	EF 11	Blacknose Dace (4)
Meriches Kill	Day	EF 12	Blacknose Dace (12) American Eel (not counted)

Massachusetts Cooperative Fish and Wildlife Research Unit**Northeast National Park Freshwater Fish Inventory****Appendix****Sampling Journal****Saratoga National Historical Park**

10/14/00-

<u>Stream/ Pond Name</u>	<u>Site</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Old Champlain Canal	Stop 10	Day	3 FN	Pumpkinseed Blue Gill
Old Champlain Canal	Stop 10	Day	15 MT	Pumpkinseed
Old Champlain Canal	Stop 10	Day	TN 1.5	Pumpkinseed White Sucker
Old Champlain Canal	Stop 10	Night	3 FN	Golden Shiner Blue Gill
Old Champlain Canal	Stop 10	Night	15 MT	Blue Gill
Old Champlain Canal	Stop 10	Night	TN 1.5	White Sucker Blue Gill Brown Bullhead
Kroma Kill	Lower	Day	EF 1	Johnny Darter Spottail Shiner Blacknose dace
Kroma Kill	Lower	Day	EF 2	Johnny Darter Spottail Shiner Blacknose dace
Kroma Kill	Lower	Day	EF 3	Johnny Darter Spottail Shiner Blacknose dace Blue Gill
Kroma Kill	Lower	Day	EF 4	Johnny Darter Spottail Shiner Blacknose dace Blue Gill
Kroma Kill	Lower	Day	EF 5	Johnny Darter Spottail Shiner Blacknose dace White Sucker Blue Gill
Kroma Kill	Lower	Day	EF 6	Johnny Darter Spottail Shiner

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SAMPLING JOURNAL: SARATOGA

Kroma Kill	Lower	Day	EF 7	Blacknose dace White Sucker Johnny Darter Spottail Shiner Blacknose dace
Kroma Kill	Lower	Day	EF 8	Johnny Darter Spottail Shiner Blacknose dace White Sucker
Kroma Kill	Upper	Day	EF 9	Johnny Darter Spottail Shiner Blacknose dace White Sucker Unidentified Dace
Kroma Kill	Upper	Day	EF 10	Johnny Darter Spottail Shiner Blacknose dace White Sucker Unidentified Dace
Kroma Kill	Upper	Day	EF 11	Johnny Darter Spottail Shiner Blacknose dace White Sucker
Kroma Kill	Upper	Day	EF 12	Spottail Shiner Unidentified dace
Kroma Kill	Upper	Day	EF 13	Johnny Darter Spottail Shiner Blacknose dace White Sucker Unidentified dace

10/15/00-

<u>Stream/ Pond Name</u>	<u>Site</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Mill Creek	Main Branch	Day	EF 1	Spottail Shiner Blacknose dace
Mill Creek	Main Branch	Day	EF 2	Spottail Shiner Blacknose dace
Mill Creek	Main Branch	Day	EF 3	Spottail Shiner Blacknose dace Johnny darter
Mill Creek	Main Branch	Day	EF 4	Spottail Shiner Blacknose dace White Sucker
Mill Creek	Main Branch	Day	EF 5	Spottail Shiner Blacknose dace

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SAMPLING JOURNAL: SARATOGA

Mill Creek	Main Branch	Day	EF 6	Spottail Shiner Blacknose dace
Mill Creek	Main Branch	Day	EF 7	Spottail Shiner Blacknose dace Johnny darter
Mill Creek	Main Branch	Day	EF 8	Spottail Shiner Blacknose dace
Mill Creek	South Branch	Day	EF 9	Spottail Shiner Blacknose dace
Mill Creek	South Branch	Day	EF 10	Spottail Shiner Blacknose dace
Mill Creek	South Branch	Day	EF 11	Blacknose dace
Mill Creek	South Branch	Day	EF 12	Spottail Shiner Blacknose dace

10/15/00-10/16/00-

<u>Stream/ Pond Name</u>	<u>Site</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Farm Pond	Davidson's	Overnight	10 MT	Pumpkinseed YOY Pumpkinseed Brown Bullhead Spottail Shiner
Farm Pond	Davidson's	Overnight	1 FN	Pumpkinseed YOY Pumpkinseed
Farm Pond	Burdil's	Overnight	5 MT	No Fish Found
Farm Pond	Burdil's	Overnight	2 FN	No Fish Found

10/16/00-

<u>Stream/ Pond Name</u>	<u>Site</u>	<u>Gear</u>	<u>Species Found</u>
Mill Creek	Main Branch	EF 13	Spottail Shiner Blacknose dace
Mill Creek	Main Branch	EF 14	Spottail Shiner Blacknose dace
Mill Creek	Main Branch	EF 15	Spottail Shiner Blacknose dace
Mill Creek	Main Branch	EF 16	Spottail Shiner Blacknose dace
Mill Creek	Main Branch	EF 17	Spottail Shiner Blacknose dace White Sucker
Mill Creek	Main Branch	EF 18	Spottail Shiner Blacknose dace

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SAMPLING JOURNAL: SARATOGA

Mill Creek	Main Branch	EF 19	Spottail Shiner Blacknose dace
Mill Creek	Main Branch	EF 20	Spottail Shiner Blacknose dace
Mill Creek	Main Branch	EF 21	Blacknose dace
Mill Creek	Main Branch	EF 22	Spottail Shiner Blacknose dace
Old Champlain Canal	Stop 10	TN 1.5(Night)	Pumpkinseed Brown Bullhead White Sucker Largemouth Bass

10/16/00-10/17/00-

<u>Stream/ Pond Name</u>	<u>Site</u>	<u>Gear</u>	<u>Species Found</u>
Old Champlain Canal	Stop 10	1 FN(Overnight)	Golden Shiner Blue Gill
Old Champlain Canal	Stop 10	15 MT(Overnight)	No Fish Found
Old Champlain Canal	South Section	9 MT(Overnight)	No Fish Found

10/17/00-

<u>Stream/ Pond Name</u>	<u>Site</u>	<u>Gear</u>	<u>Species Found</u>
American River	along Rt. 4	EF 1	No Fish Found
American River	along Rt. 4	EF 2	No Fish Found

Massachusetts Cooperative Fish and Wildlife Research Unit**Northeast National Park Freshwater Fish Inventory****Appendix****Sampling Journal****Saint Gaudens National Historic Site****10/19/00-**

<u>Stream/ Pond Name</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Blow-me-down Brook	Day	EF1	Common Shiner (30) White sucker (10) Blacknose dace (78) Spottail Shiner (4)
Blow-me-down Pond	Night	3 FN	Pumpkinseed (33) Common Shiner (230) White sucker (24) Golden Shiner (84) Spottail Shiner (8) Brown Bullhead (4) Unidentified shiner (1)
Blow-me-down Pond	Night	15 MT	Common Shiner (168) Golden Shiner (5) Spottail Shiner (8) Brown Bullhead (5) Pumpkinseed (20) Blacknose dace (2) Black Bullhead (1)
Blow-me-down Pond	Night	TN 1.5	Fallfish (1)

10/20/00-

<u>Stream/ Pond Name</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Blow-me-down Brook	Day	EF2	Spottail Shiner (4) Blacknose dace (10) White sucker (5) Pumpkinseed (1) Longnose dace (1)
Blow-me-down Brook	Day	EF3	Longnose dace (3)

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SAMPLING JOURNAL: SAINT GAUDENS

Blow-me-up Brook	Day	EF4	Spottail Shiner (1) Blacknose dace (1) Mottled sculpin (3)
Blow-me-up Brook	Day	EF5	Blacknose dace (2) Mottled sculpin (2)
Blow-me-up Brook	Day	EF6	Blacknose dace (6) Mottled sculpin (3)
Blow-me-up Brook	Day	EF7	Spottail Shiner (1) Blacknose dace (4) Mottled sculpin (7) White sucker (1)
Blow-me-up Brook	Day	EF8	Brook trout (1) Blacknose dace (4) Mottled sculpin (4)
Blow-me-up Brook	Day	EF9	Spottail Shiner (1) Blacknose dace (4) Mottled sculpin (3)
Blow-me-up Brook	Day	EF10	Spottail Shiner (1) Blacknose dace (4) Mottled sculpin (10)
Blow-me-up Brook	Day	EF11	Brook trout (4) Blacknose dace (4) Mottled sculpin (2)
Blow-me-down Pond	Day	3 FN	Common Shiner (38) White sucker (1) Golden Shiner (3)
Blow-me-down Pond	Day	15 MT	Common Shiner (145) Spottail Shiner (3) Blacknose dace (2) Pumpkinseed (3) Golden Shiner (1) White Sucker (1)
Blow-me-down Pond	Day	TN 1.5	White Sucker (2) Fallfish (1)
Blow-me-down Pond	Night	3 FN	Spottail Shiner (15) Pumpkinseed (22) Common Shiner (40)

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SAMPLING JOURNAL: SAINT GAUDENS

Blow-me-down Pond	Night	15 MT	Golden Shiner (135) White sucker (6) Brown Bullhead (3) Spottail Shiner (11) Pumpkinseed (9) Common Shiner (63) Golden Shiner (3) White Sucker (2) No Fish Found
Blow-me-down Pond	Night	TN 1.5	No Fish Found

10/21/00-

<u>Stream/ Pond Name</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Blow-me-up Brook	Day	EF Pool	Blacknose dace (1)
Blow-me-up Brook	Day	EF12	Brook trout (1)
Blow-me-up Brook	Day	EF13	No Fish Found
Blow-me-up Brook	Day	EF14	Blacknose dace (6)
Blow-me-up Brook	Day	EF15	No Fish Found
Blow-me-up Brook	Day	EF16	No Fish Found
Blow-me-up Brook	Day	EF17	No Fish Found
Farm Pond	Day	1 FN, 15 MT	No Fish Found

Massachusetts Cooperative Fish and Wildlife Research Unit**Northeast National Park Freshwater Fish Inventory****Appendix****Sampling Journal****Minuteman National Historical Park****10/24/00-**

<u>Stream/ Pond Name</u>	<u>Site</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Farm Pond	Palumbo's	Night	3 FN	Brown Bullhead (1) Pumpkinseed (2)
Farm Pond	Palumbo's	Night	15 MT	No Fish Found

10/24/00-10/25/00

<u>Stream/ Pond Name</u>	<u>Site</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Farm Pond	Palumbo's	Overnight	3 FN	Brown Bullhead (1)
Farm Pond	Palumbo's	Night	15 MT	Redfin Pickerel (1)

10/25/00-

<u>Stream/ Pond Name</u>	<u>Site</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Mill Brook	North Bridge	Day	EF1	Redfin Pickerel (1) Golden Shiner (1)
Mill Brook	North Bridge	Day	EF2	No Fish Found
Mill Brook	North Bridge	Day	EF3	Yellow Perch (1)
Mill Brook	North Bridge	Day	EF4	Redfin Pickerel (4) Pumpkinseed (2)
Unnamed Brook	North Bridge	Day	EF1	No Fish Found
Unnamed Brook	North Bridge	Day	EF2	No Fish Found
Mill Brook	Wayside Site	Day	EF1	No Fish Found
Mill Brook	Wayside Site	Day	EF2	Redfin Pickerel (1)
Unnamed Pond	Visitor Center	Day	3 FN	Largemouth Bass (10) Pumpkinseed (2) Blue Gill (20)
Unnamed Pond	Visitor Center	Day	15 MT	Largemouth Bass (1) Blue Gill (23)

APPENDIX

SAMPLING JOURNAL: MINUTEMAN

10/25/00-10/26/00

<u>Stream/ Pond Name</u>	<u>Site</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Unnamed Pond	Visitor Center	Overnight	3 FN	Blue Gill (25) Largemouth Bass(7) Pumpkinseed (2)
Unnamed Pond	Visitor Center	Overnight	15 MT	Blue Gill (6)

10/26/00-

<u>Stream/ Pond Name</u>	<u>Site</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Elm Brook	wetlands	Day	EF 1	Redfin pickerel (3) Brook trout (1)
Elm Brook	forested	Day	EF2	Redfin Pickerel (1) Brook trout (17) American eel (1)
Elm Brook	forested	Day	EF3	Brook trout (12) American eel (1)
Mill Brook	Tributary	Day	EF1	No Fish Found
Mill Brook	behind Palumbo's			Not Sampled

10/26/00-10/27/00

<u>Stream/ Pond Name</u>	<u>Site</u>	<u>Time</u>	<u>Gear</u>	<u>Species Found</u>
Folly Pond	along 2A	Overnight	15 MT	No Fish Found

Massachusetts Cooperative Fish and Wildlife Research Unit**Northeast National Park Freshwater Fish Inventory****Summary****Anthropogenic Effects****WEFA-****Weir Farm Pond:**

- Invasive species, e.g. Asian barberry (communication with Greg Waters)
- Repairs to dam (communication with Greg Waters)
- "...concern for nutrient loading from septic systems and lawn maintenance." (Project Plan)

MABI-**Pogue:**

- vulnerable to nutrient and chemical loading from atmospheric deposition (Project Plan)
- most concerns apply primarily to the Unnamed Brook that drains from pond into Barnard Brook.

ROVA-**General Park Concerns:**

- "discharge of industrial wastes like toxic compounds, particulates and dissolve pollutants." (Water Resources Management Plan)
- "Nutrient loading of nitrogen and phosphorus from municipal and residential wastes and fertilizers." (Water Resources Management Plan)
- "Road salt and auto exhaust by-product runoff from roads to surface and ground water." (Water Resources Management Plan)
- Gasoline and oil product contamination of surface and ground water by residential and commercial spillage." (Water Resources Management Plan)
- "Bacterial and infectious agent contamination from septic systems" (Water Resources Management Plan)
- potential for zebra mussel introductions into ROVA through human activities (Water Resources Management Plan)

Eleanor Roosevelt-**Upper Val-kill Pond:**

- "Continued residential development upstream and adjacent to Eleanor Roosevelt has contributed to an influx of nutrients from septic systems resulting in nutrient loading in adjacent wetlands and ground waters which then transport nutrients to Upper Val-kill Pond." (Water Resources Management Plan)
- sediment build-up (Water Resources Management Plan)
- growth of significant stands of purple loose strife resulting from sedimentation and nutrient loading. (Water Resources Management Plan)

- significant levels of benzene in residential well adjacent to Eleanor Roosevelt. No contamination found within park, but cannot be discounted either. (Water Resource Management Plan)

Fall Kill Creek: tributaries running through residential areas may be contributing "excess nitrogen and phosphate from septic systems or lawn fertilizers and organic compounds (primarily oil and oil by-products) from residential activities." (Water Resources Management Plan)

Lower Valkill Pond:

- invasive purple loosestrife (Water Management Plan)
- sedimentation from impoundment (Water Management Plan)

FDR-

Meriches Kill

Roosevelt Ice Pond:

- sedimentation from impoundment (Water Management Plan)

Roosevelt Cove

Vanderbilt-

Crum Elbow Creek-

- prior discharges of alum from a water treatment plant upstream of park boundary do not appear to be adversely affecting communities. (Biological Assessment: Crum Elbow Creek)
- affected by impoundment effects (Biological Assessment: Crum Elbow Creek)

Upper Pond

Middle Pond

Lower Pond

SARA-

General Park Concerns:

- Effects on water resources, primarily upper branches of Kroma Kill and Mill Creek, of construction on culverts
- PCB contamination from upstream Superfund Site on resources closest to and connected to Hudson River. Has not been shown to be a problem, but shouldn't be ruled out

MORR-

General Park Concerns:

- aluminum levels from acid precipitation should be monitored for water and soils. (Mele 1983)
- Residential development adjacent to park should be assessed to determine effects on already high water quality. (Mele 1983)
- Effect on water levels from water extraction in private wells adjacent to park (Mele 1983)

Primrose Brook:

- reported fecal coliform contamination could be corrected by upgrading septic leaching fields adjacent to park boundaries. (Mele 1983)

- least heavily human-influenced stream with exception of 4-5 residences in upper reaches (Water Resources Scoping Report)

Jersey Brook:

- water quality of lower reaches likely effected by road salts and other contaminants from Tempe Wicke Road (Water Resources Scoping Report)

Passaic River:**MIMA-****Mill Brook:**

- "Sources of water quality degradation include road runoff and limited agriculture." (Project Plan)

Mill Brook Tributary:

- probably same as Mill Brook. Nothing was said in Project plan.

Elm Brook:

- "Sources of water quality degradation include road runoff and limited agriculture." (Project Plan)
- Exotic species invading section below Route 2A. (communication with Bill Fuchs)

Unnamed Brook (MVC):

- "...of concern because it flows from Hanscom Air Force Base, a highly industrialized area." (Project Plan)

Unnamed Pond (MVC):

- Residence of park employees next to the pond. (Project Plan)
- "...Partly fed by streams running out of Hanscom Air Force Base." (Project Plan)

Folly Pond:

- "...past research showed significant contamination from old landfill activities at this site. Past and on-going monitoring at this site..." (Project Plan)

Unnamed Brook (NBU):

- Septic system drain field located just uphill of stream. New system to be installed, but still close to stream. (communication with Bill Fuchs)

SAGA-**Blow-me-up Brook:**

- state stocks brook trout (Cook 1986)

Blow-me-down Brook:

- state stocks brook trout (Cook 1986)

Blow-me-down Pond:

- water level lowered to repair dam in 1984-85, potentially causing changes in species composition and relative abundance numbers. (Cook 1986)

Farm Pond:

- may have been affected by bordering pasture and grazing animals in past; none of these practices appear to be going on currently. (personal observation)

CACO- taken from Water Resource Management Plan; Cape Cod National Seashore.

Pg. 6: Six water resource issues of concern at CACO

1. Groundwater withdrawal impacts

2. Water resource contamination from non-point sources
 3. Confirmed and potential contamination sites
 4. Recreation impacts to pond water quality
 5. Park facilities management
 6. Impacts of tidal restrictions
- "Groundwater is... threatened by increased water withdrawal, septic effluent, and contamination." (Pg. 130)
 - Non-point source pollution is a problem due to the "relatively permeable nature of the soils to nutrients, and the almost total reliance on private septic systems..." (Pg. 131)
 - Contamination from "landfills, mostly uncapped, and associated septage lagoons..." (Pg. 131)
 - Water efficiency of park run facilities does not exist. (Pg. 131)
 - Several major estuaries have been diked historically and consequences of restoration of these resources need to be explored. (Pg.131)